

TOSHIBA

FILE NO. A90-9821

SERVICE MANUAL

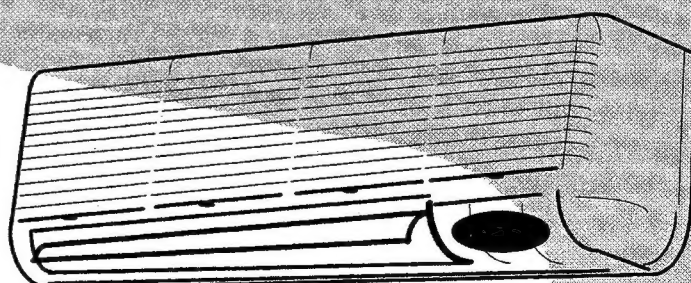
AIR-CONDITIONER

SPLIT WALL TYPE, COOLING ONLY

RAV-183K-PE/RAV-182A-PE

RAV-243K-PE/RAV-242A-PE

RAV-243K-PE/RAV-242A8-PE



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SUMMARY

- The units referred to within this manual conform with the protection requirements of Directives 89/336/EEC Electromagnetic Compatibility and 73/23/EEC Low Voltage.
- Operating conditions of units are as follows:

OUTDOOR TEMPERATURE	-2 TO 43°C
ROOM TEMPERATURE	18 TO 32°C
ROOM HUMIDITY	LESS THAN 80%

Note 1 : Cooling Capacity is based on the following temperature conditions:

Indoor air inlet temperature 27°C DB, 19°C WB.

Outdoor air inlet temperature 35°C DB.

Note 2: For details on Control Circuits and Remote Controller, refer to Service Manual A90-9504

Note 3: Metric / Imperial pipe conversion.

Diameter (mm)	6.4	9.5	12.7	15.9	19	22
Nominal Diameter (inch)	1/4	3/8	1/2	5/8	3/4	7/8

1. SPECIFICATIONS

ITEM		MODEL	RAV-183K-PE
Cooling capacity	kW		5.0
	Phase		1
Power source	V		220-240
	Hz		50
			COOLING
Power consumption	kW		2.2
Power factor	%		90
Running current	A		10.6
Starting current	A		60
Operating noise (SPL)	Indoor unit (High, Med, Low)	dB(A)	43/39/36
	Outdoor unit	dB(A)	50
Refrigerant	Name of refrigerant		R-22
	Charge volume	kg	1.45
	Add. volume (20-30m)	g/m	35
Refrigerant control			Capillary tube
Interconnection pipe	Larger side size	mm	ø12.7
	Coupler style		Flare
	Smaller side size	mm	ø6.4
	Coupler style		Flare
	Standard length	m	7.5
	Maximum actual pipe length (of one way)	m	30
	Maximum height difference		
	If indoor unit higher	m	15
	If outdoor unit higher	m	30
Condensate drain pipe diameter		mm	ø20 (ID)
INDOOR UNIT Model			RAV-183K-PE
Appearance colour			Silky Mist
Dimensions	Height	mm	372
	Width	mm	1,149
	Depth	mm	226
Net weight	kg		20
Heat exchanger type			Finned tube
Indoor fan type			Transverse Flow Fan
Air volume	m³/h		780
Fan motor output	W		27
Air filter			Washable
OUTDOOR UNIT Model			RAV-182A-PE
Appearance colour			Bronze white (Munsell 6Y7.5/1)
Dimensions	Height	mm	740
	Width	mm	880
	Depth	mm	310
Net weight	kg		58
Heat exchanger type			Finned tube
Outdoor fan type			Propeller fan
Air flow volume	m³/h		2,700
Fan motor output	W		39
Compressor	Model		PH250X3-4LS
	Output	kW	1.5
Protective device			Fuse, Crankcase heater, Overload relay

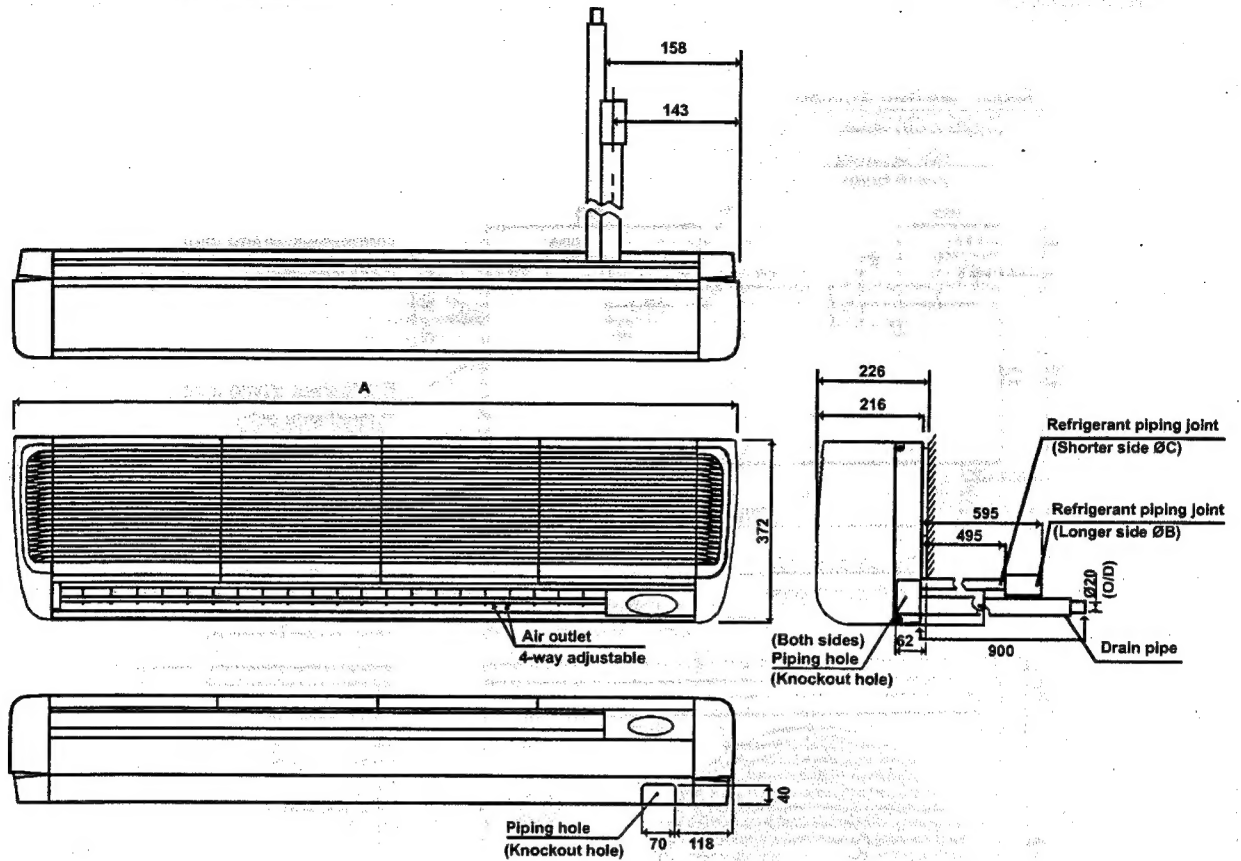
Specifications are subject to change without notice.

ITEM		MODEL	RAV-243K-PE	RAV-243K-PE
Cooling capacity	kW		6.7	
	Phase		1	3
Power source	V		220-240	380-415
	Hz		50	
			COOLING	COOLING
Power consumption	kW		2.9	2.8
Power factor	%		93	86
Running current	A		13.5	4.7
Starting current	A		80	25
Operating noise (SPL)	Indoor unit	dB (A)	44/40/37	
	Outdoor unit	dB (A)	53	
Refrigerant	Name of refrigerant		R-22	
	Charge volume	kg	1.65	
	Add. volume (20-30m)	g/m	45	
Refrigerant control			Capillary tube	
Interconnection pipe	Larger side size	mm	ø 15.9	
	Coupler style		Flare	
	Smaller side size	mm	ø 6.4	
	Coupler style		Flare	
	Standard length	m	7.5	
	Maximum actual pipe length (of one way)	m	30	
	Maximum height difference			
	If indoor unit higher	m	15	
	If outdoor unit higher	m	30	
	Condensate drain pipe diameter	mm	ø 20 (ID)	
INDOOR UNIT Model			RAV-243K-PE	
Appearance colour			Silky Mist	
Dimensions	Height	mm	372	
	Width	mm	1,478	
	Depth	mm	226	
Net weight	kg		26	
Heat exchanger type			Finned tube	
Indoor fan type			Transverse Flow Fan	
Air volume	m³/h		1200	
Fan motor output	W		27	
Air filter			Washable	
OUTDOOR UNIT Model			RAV-242A-PE	RAV-242A8-PE
Appearance colour			Bronze white (Munsell 6Y7.5/1)	
Dimensions	Height	mm	790	
	Width	mm	880	
	Depth	mm	310	
Net weight	kg		64	
Heat exchanger type			Finned tube	
Outdoor fan type			Propeller fan	
Air flow volume	m³/h		3,000	
Fan motor output	W		63	
Compressor	Model		PH330X3-4MS	YH330X3-MS
	Output	kW	2.2	2.2
Safety device			Fuse, Crankcase heater, Inner overload relay	Fuse, Overcurrent relay, Return-Lock Crankcase heater, Thermostat

Specifications are subject to change without notice.

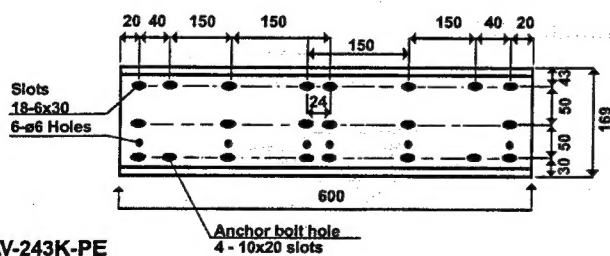
2. CONSTRUCTION VIEWS

2.1 Indoor Unit RAV-183K-PE RAV-243K-PE

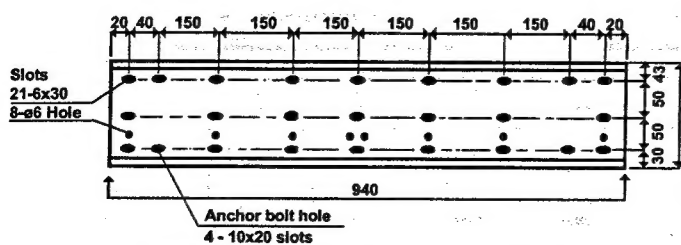


MODEL	A	B	C
RAV-183K-PE	1149	12.7	6.4
RAV-243K-PE	1478	15.9	6.4

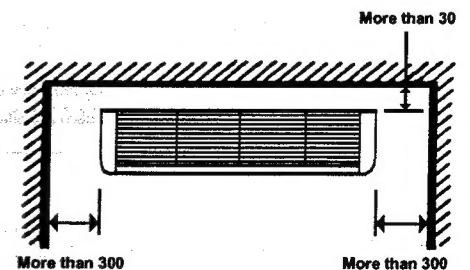
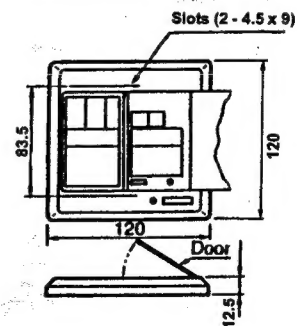
RAV-183K-PE



RAV-243K-PE



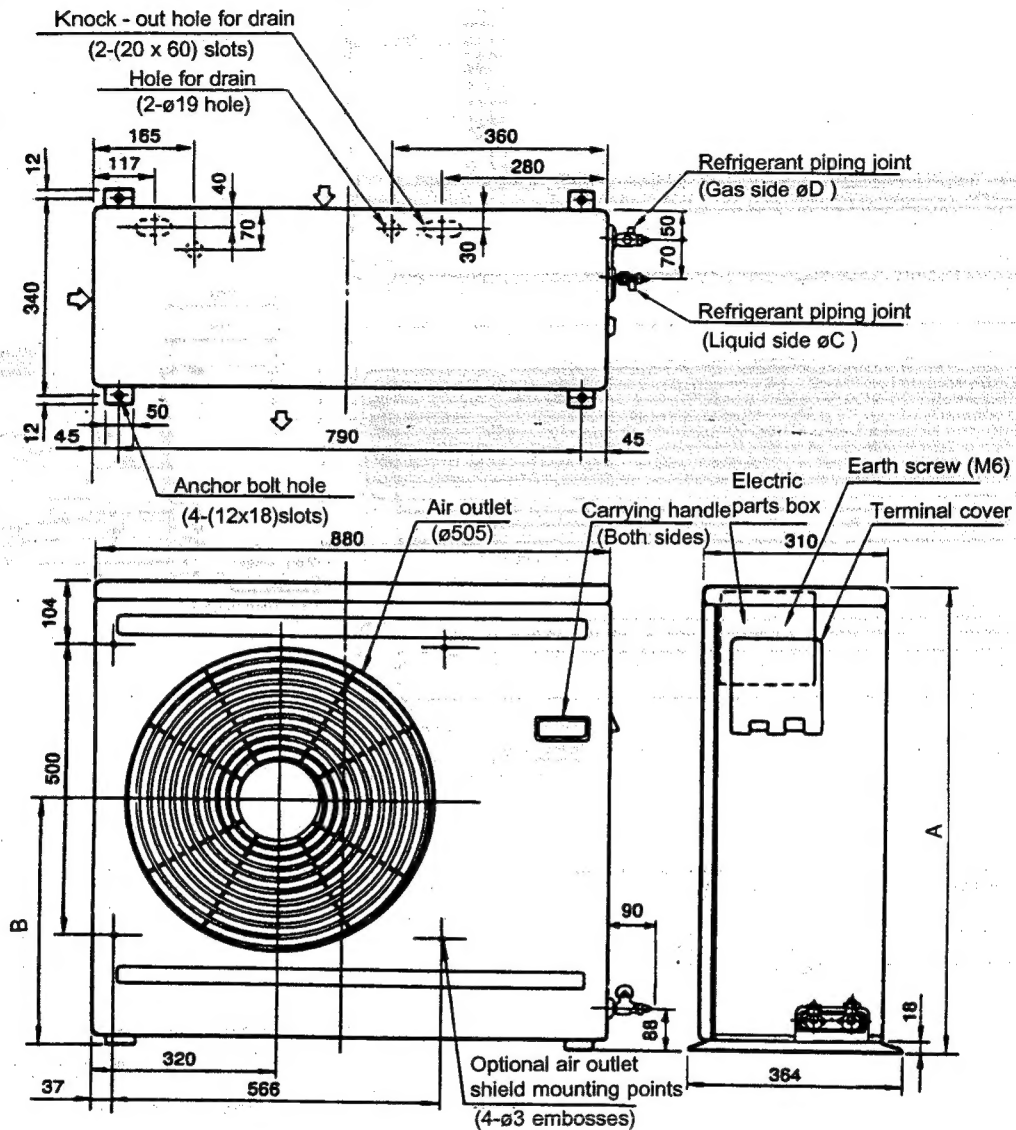
Remote controller



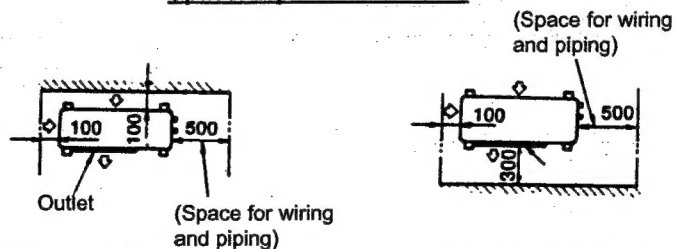
Space required for service

Installation board mounting bolt hole location

2.2 Outdoor unit
RAV-182A-PE
RAV-242A-PE
RAV-242A8-PE



Space required for service



When installed with the inlet faced to the wall side

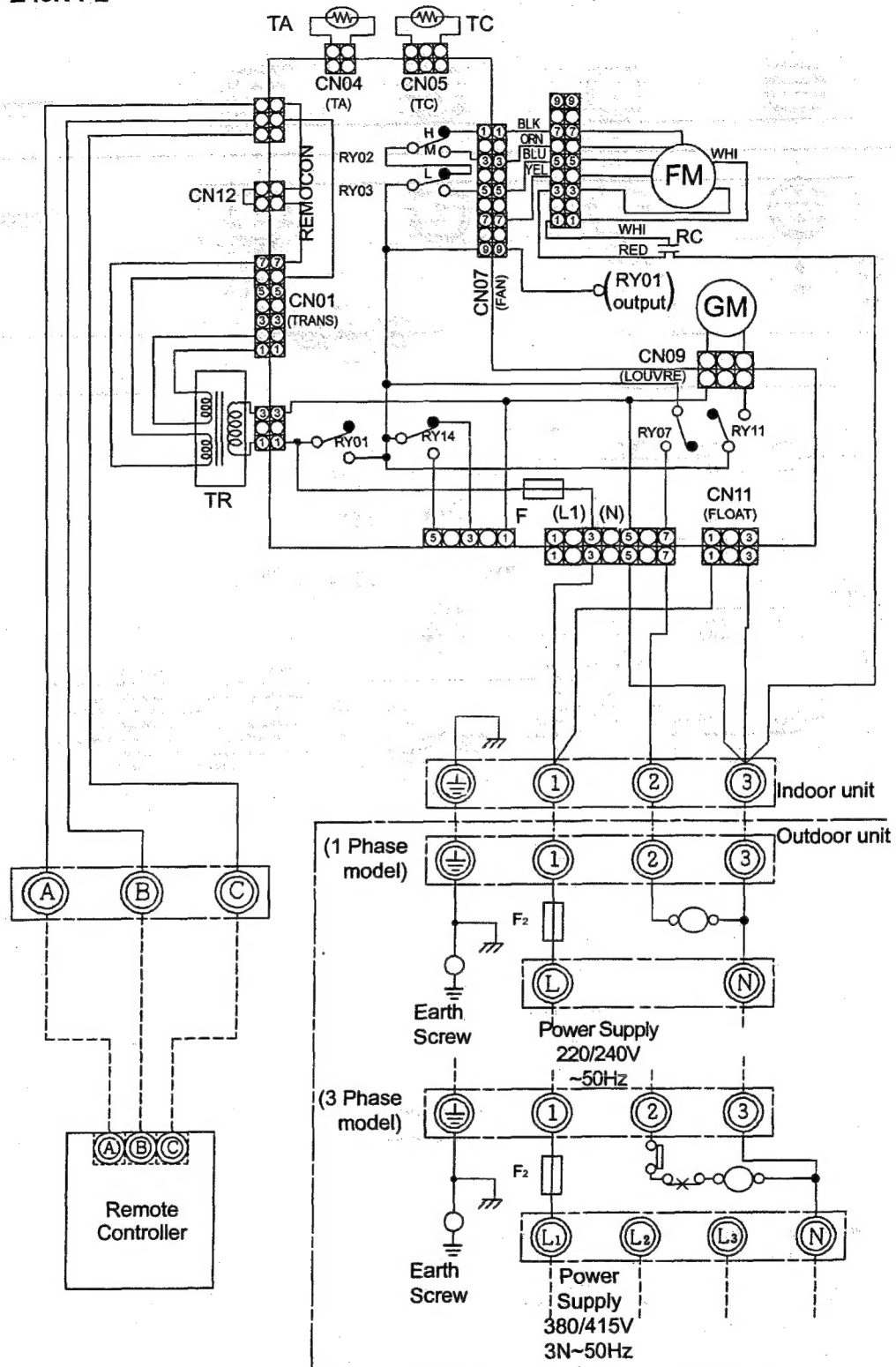
When installed with the outlet faced to the wall side

Model	A	B	C	D
RAV-182A-PE	740	380	6.4	12.7
RAV-242A-PE RAV-242A8-PE	790	430	6.4	15.9

(Unit: mm)

3. WIRING DIAGRAMS

3.1 RAV-183K-PE RAV-243K-PE

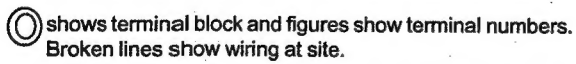


Symbol	Name	Symbol	Name
FM	Fan motor	TA	Sensor (Air)
RC	Running capacitor	TC	Sensor (Coil)
TR	Transformer	RY01-RY14	Relay
F	Fuse (PCB)	F2	Fuse (T5A)
GM	Geared Motor		

○ Shows terminal block and figures show terminal numbers. Broken lines show wiring at site.

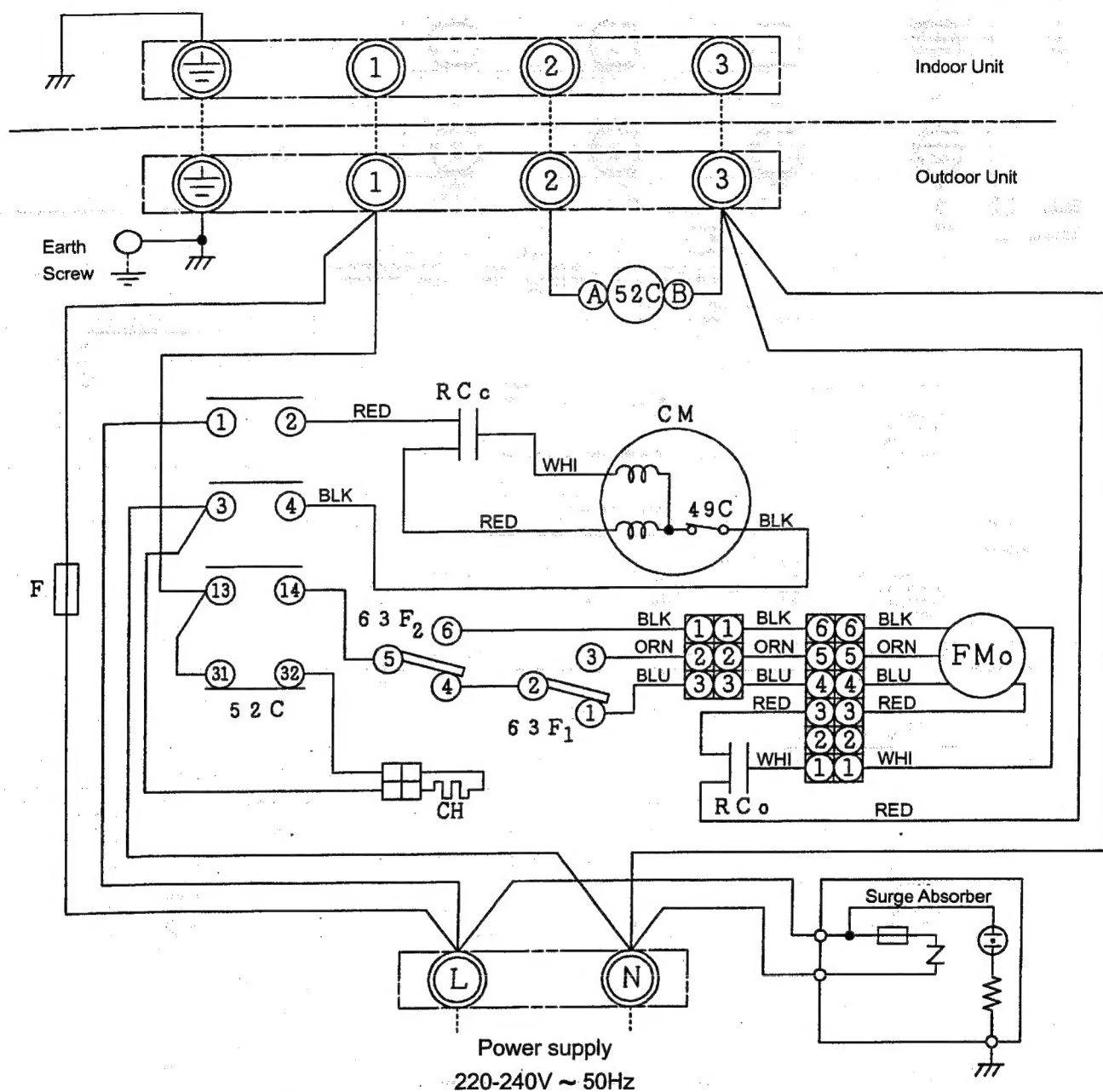
Do not operate the units with magnetic contactor pushed in.

• **Wiederholungsfragen:** Welche Aufgaben hat das Immunsystem? Wie wird eine Immunantwort ausgelöst? Welche Rolle spielen Antikörper?



Do not operate the units with the magnetic contactor pushed in.

3.3 RAV-242A-PE

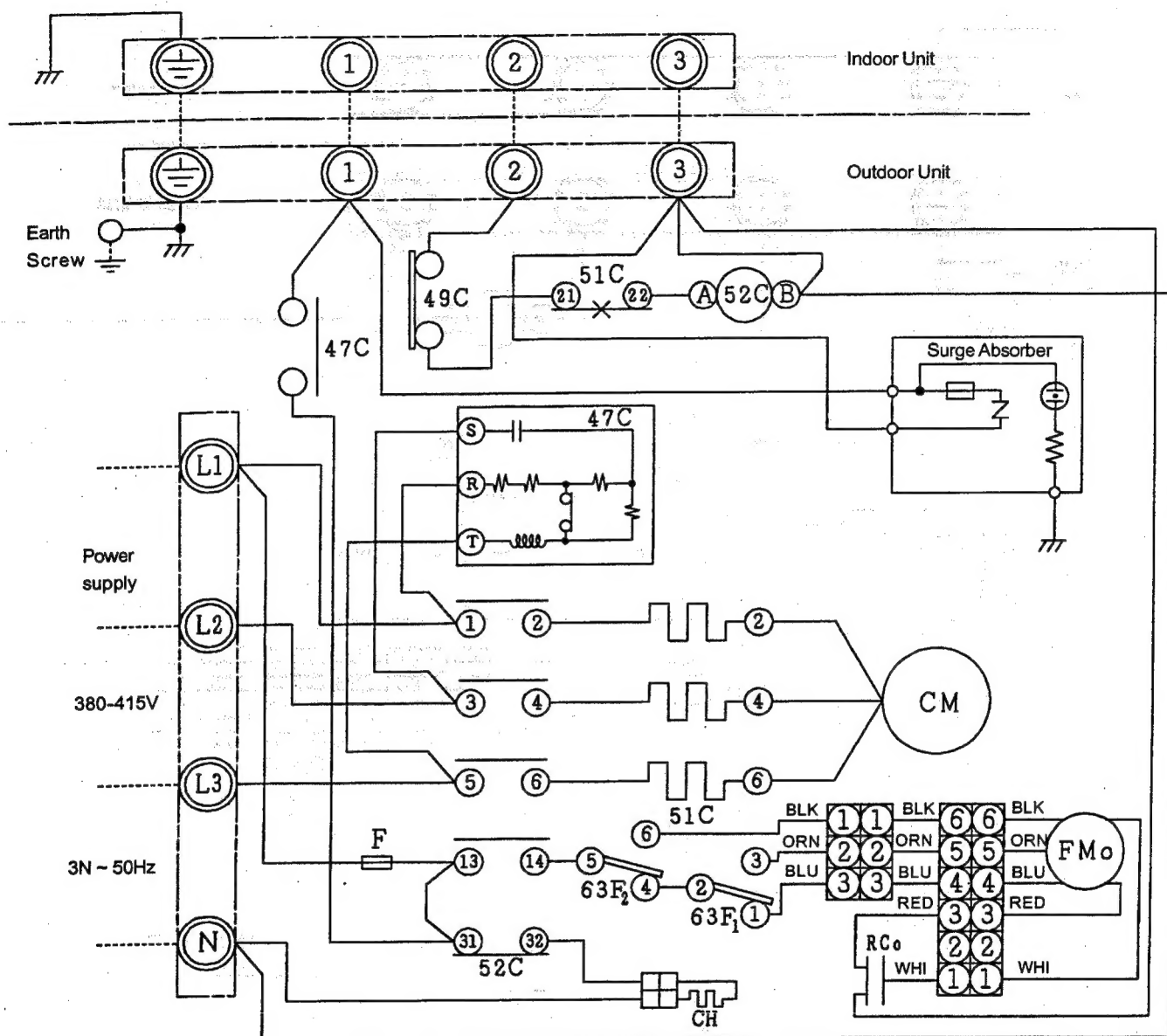


⊙ shows terminal block and figures show terminal numbers.
Broken lines show wiring at site.

Do not operate the units with the magnetic contactor pushed in.

Symbol	Name	Symbol	Name
RCc	Running Capacitor (Comp.)	CM	Compressor
49C	Inner Overload Relay	52C	Magnetic Contactor
63F _{1,2}	Pressure Switch (2-stage)	FMo	Fan Motor
RCo	Running Capacitor (Fan Motor)	CH	Crank Case Heater
F	Fuse (T5A)		

3.4 RAV-242A8-PE



1. shows terminal block and figures show terminal numbers.
Broken lines show wiring at site.
2. When the phases are not connected correctly, the reverse phase protector operates and the unit will not start.
In this case, check the three phase wiring.

Do not operate the units with the magnetic contactor pushed in.

Symbol	Name	Symbol	Name
47C	Return Lock	CM	Compressor
51C	Overcurrent Relay	52C	Magnetic Contactor
63F _{1,2}	Pressure Switch (2-stage)	FMo	Fan Motor
RCo	Running Capacitor (Fan Motor)	49C	Thermostat
F	Fuse (T5A)	CH	Crank Case Heater

4. SPECIFICATION OF ELECTRICAL PARTS

4.1 RAV-183K-PE

	Geared motor for louvre	MT8-3-6	AC 230V, 3W						
	Sensor for room temperature			°C	15	20	25	30	40
				kΩ	16.1	12.6	10.0	8.0	5.2
	Indoor unit sensor for heat-exchanger temperature	DTN-C103J40	Maximum input 34mA	°C	-12	0	25	50	
				kΩ	62.29	32.82	10.0	3.59	

4.2 RAV-243K-PE

No	PARTS NAME								
1	Indoor unit fan motor								
2	Running capacitor for Indoor fan motor								
3	Transformer (Indoor unit)								
4	Geared motor for louvre	MT8-3-6	AC 230V, 3W						
5	Sensor for room temperature		Maximum input 38mA						
6	Indoor unit sensor for heat-exchanger temperature	DTN-C103J40	Maximum input 34mA						

4.3 RAV-182A-PE

No.	Parts Name	Type	Specifications		
1	Compressor	PH250X3-4LS	Output (Rated)1.5kW, 2 pole,220/240V, 1 phase, 50Hz		
			Winding resistance (Ω) (at 20°C)	Red-White	Red-Black
			3.43	1.13	2.30
2	Outdoor unit fan motor	SMF-230-39N-3	Output (Rated) 39W, 6 pole, 230V, 1 phase, 50Hz Winding resistance 97.1Ω at 20°C (Red-Black)		
3	Running capacitor for outdoor fan motor	EEP2G405HQA114	AC400V, 4μF		
4	Magnetic contactor	FMCa-1S	AC230V, 50Hz		
5	Pressure switch (2-stage)	STB-X602	Tripping pressure 19kg/cm²G, 21kg/cm²G Resetting pressure 13kg/cm²G, 15kg/cm²G		
6	Crankcase heater		AC240V, 28W		
7	Fuse		T5A		
8	Running capacitor for compressor	MT-44MP456W	AC 440V, 45μF		
9	Overload relay	OL-177GM15	AC240V, Tripping temp: 165°C, Resetting temp: 80°C		

4.4 RAV-242A-PE

No.	Parts Name	Type	Specifications			
1	Compressor	PH330X3-4MS	Output (Rated) 2.2kW, 2 pole,220/240V, 1 phase, 50Hz			
			Winding resistance (Ω) (at 20°C)	Red-White	Red-Black	Black-White
			2.62	0.77	1.87	
2	Outdoor unit fan motor	SMF-230-63N-3	Output (Rated) 39W, 6 pole, 230V, 1 phase, 50Hz Winding resistance 92.0Ω at 20°C (Red-Black)			
3	Running capacitor for outdoor fan motor	EEP2G405HQA114	AC400V, 4μF			
4	Magnetic contactor	FMCa-1S	AC230V, 50Hz			
5	Pressure switch (2-stage)	STB-X603	Tripping pressure 21kg/cm²G, 23kg/cm²G Resetting pressure 15kg/cm²G, 17kg/cm²G			
6	Crankcase heater		AC240V, 28W			
7	Fuse		T5A			
8	Running capacitor for compressor	EAR42M606UF	AC 420V, 60μF			

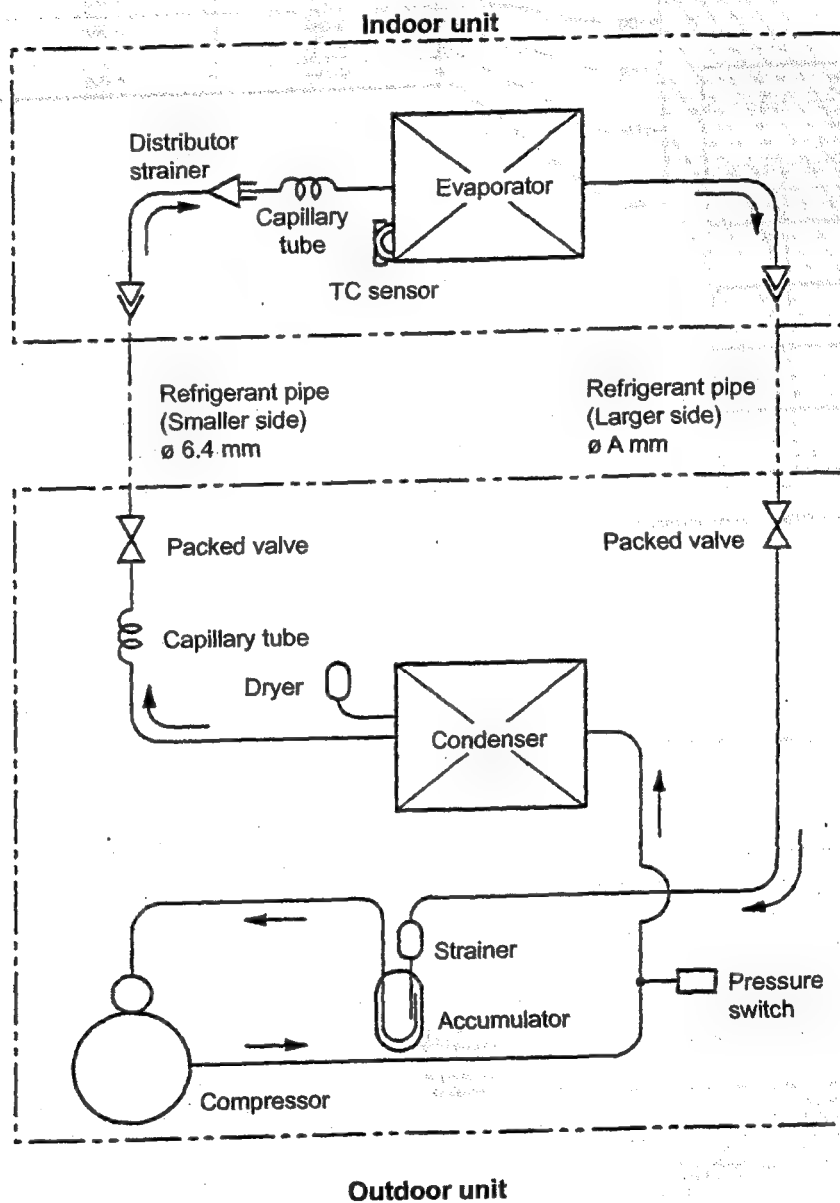
4.5 RAV-242A8-PE

No.	Parts Name	Type	Specifications
1	Compressor	YH330X3-MS	Output (Rated) 2.2kW, 2 pole, 380/415V, 3 phase, 50 Hz Winding resistance 4.15 Ω at 20°C (Red-Black)
2	Outdoor unit fan motor	SMF-230-63N-3	Output (Rated) 63W, 6 pole, 230V, 1 phase, 50 Hz Winding resistance 92.0 Ω at 20°C (Red-Black)
3	Running capacitor for outdoor fan motor	EEP2G405HQA114	AC 400V, 4 μ F
4	Magnetic contactor	FMSa-1	AC 230V, 50Hz, Tripping current 7.5A, Manual reset
5	Pressure switch (2-stage)	STB-X603	Tripping pressure 21 kg/cm ² G, 23 kg/cm ² G Resetting pressure 15 kg/cm ² G, 17 kg/cm ² G
6	Crankcase heater		AC 240V, 28W
7	Fuse		T5A
8	Bimetal thermostat	CS-7	Tripping temperature 120 °C Resetting temperature 90 °C
9	Return lock	STR-4AD	AC400/440V

5. REFRIGERANT PIPING DIAGRAM

5.1 Indoor unit
RAV-183K-PE
RAV-243K-PE

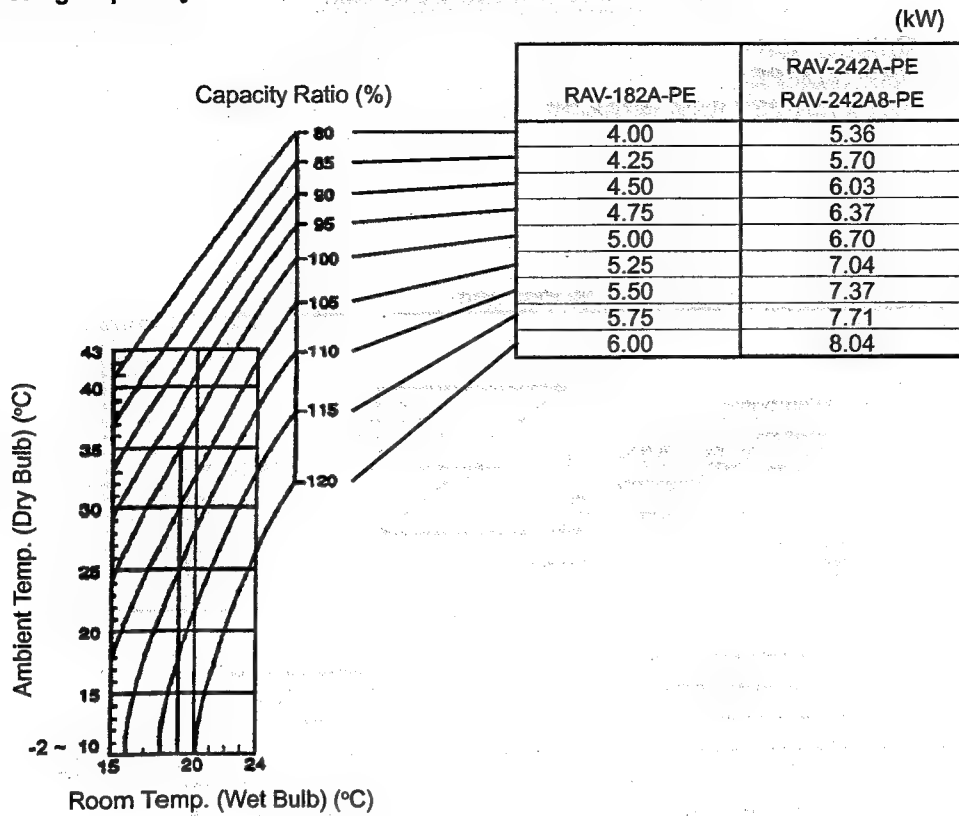
Outdoor unit
RAV-182A-PE
RAV-242A-PE / RAV-242A8-PE



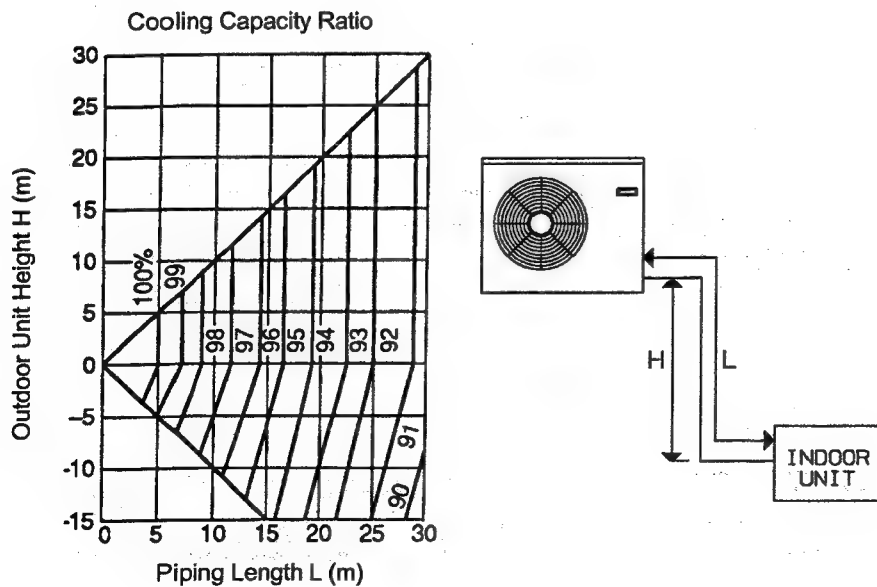
Indoor Unit		Outdoor Unit		A
Model	Capillary	Model	Capillary	
RAV-183K-PE	IDø1.5 x 300L x 4P	RAV-182A-PE	IDø2.4 x 600L x 1P	12.7
RAV-243K-PE	IDø1.7 x 400L x 4P	RAV-242A-PE & RAV-242A8-PE	IDø2.4 x 300L x 1P	15.9

6. PERFORMANCE CHARACTERISTICS

6.1 Cooling capacity



6.2 Cooling Capacity Ratio



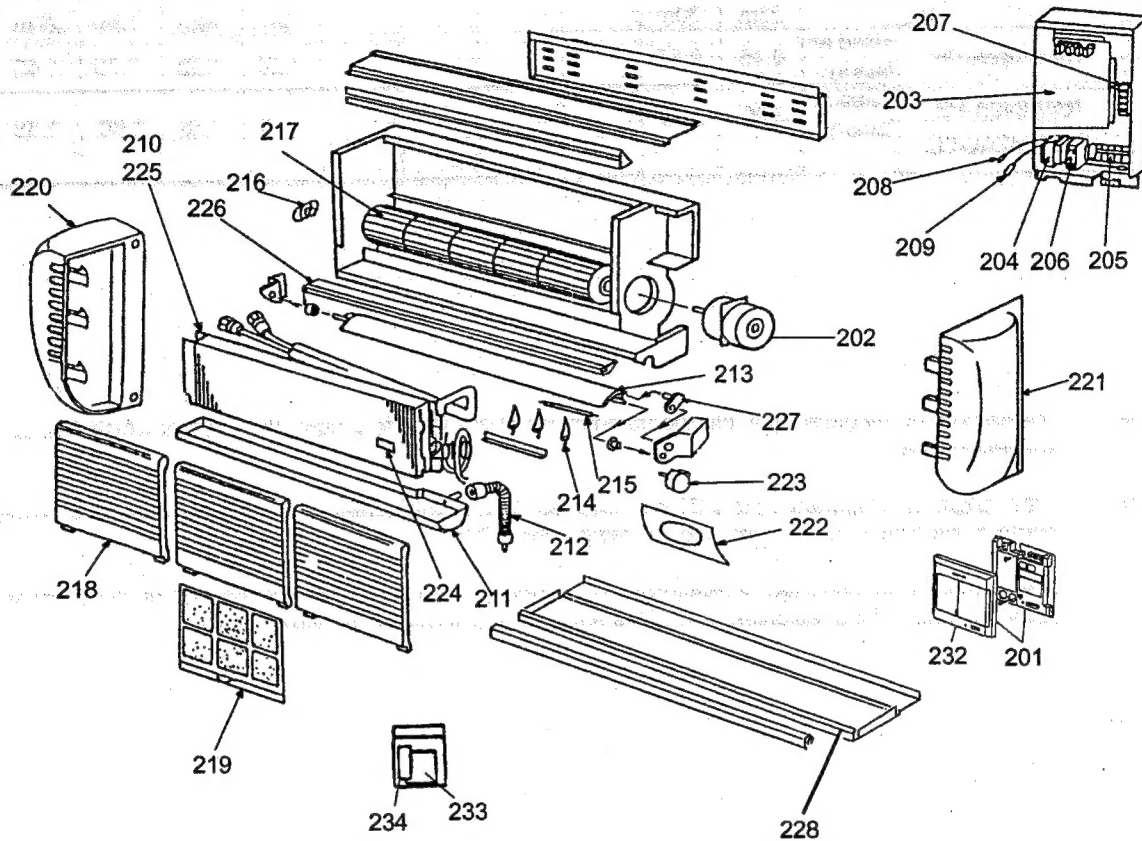
6.3 Piping length/additional refrigerant volume

Model	Piping length less than (m)	up to 20m	For longer lengths add refrigerant (kg) \pm 50g					Refrigerant charge (kg) \pm 50g if unit is reclaimed					
			up to 25m	up to 30m				up to 5m	up to 10m	up to 15m	up to 20m	up to 25m	up to 30m
RAV-182A-PE	Filled at factory		0.15	0.35				1.20	1.30	1.35	1.45	1.60	1.80
RAV-242A-PE RAV-242A8-PE	Filled at factory		0.20	0.45				1.50	1.55	1.60	1.65	1.85	2.10

- The amount of refrigerant put into the outdoor unit at the factory is equivalent to that which fills up 20m length of refrigerant pipe.
- If the length of refrigerant pipe is 20m or less, addition of refrigerant at the installation site is unnecessary. If the length of the pipe exceeds 20m, add the refrigerant R-22.
- Overcharge or undercharge of refrigerant in the outdoor unit will cause malfunction of the compressor. The prescribed amount of the replenishment of the refrigerant is shown in the table above.

7. EXPLODED VIEWS AND PARTS LISTS

7.1 Indoor unit RAV-183K-PE RAV-243K-PE

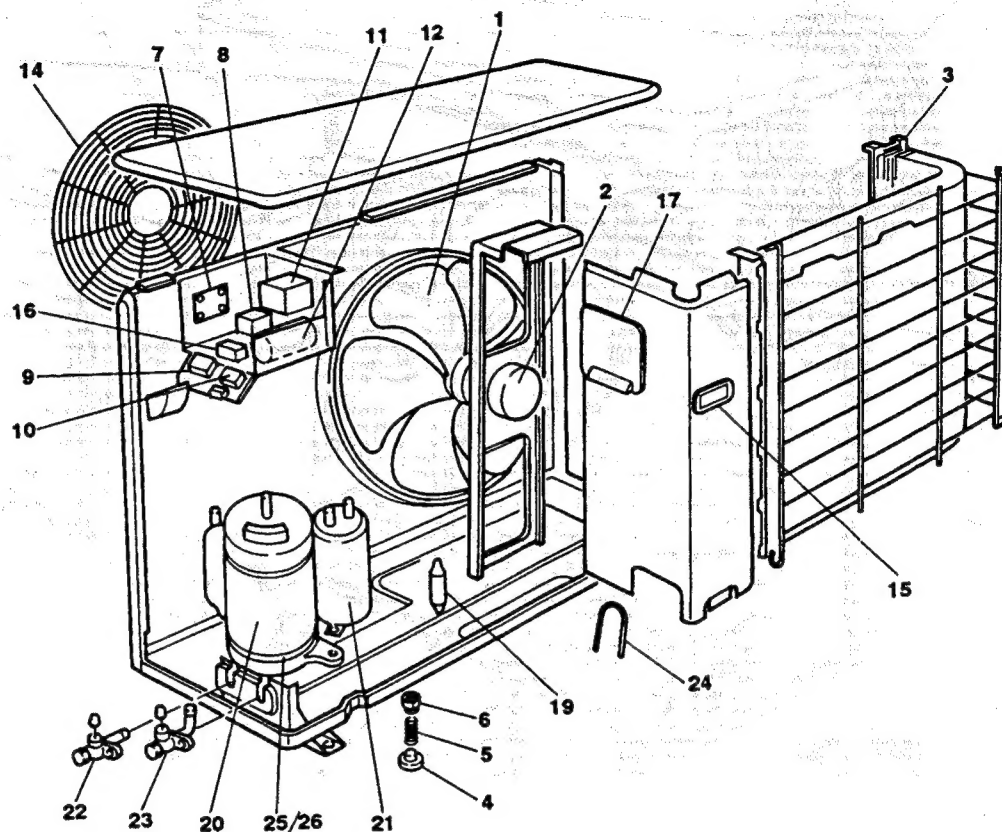


Location No	Part No	Description
201	43A69004	Remote Controller
202	43A21016	Motor (RAV-183K-PE)
202	43A21017	Motor (RAV-243K-PE)
203	43A69005	PC Board
204	43A58002	Transformer
205	43A60001	Terminal 4P
206	43155101	Capacitor
207	43A60002	Terminal 3P
208	43150118	Sensor, TA
209	43150116	Sensor, TC
210	43A44022	Evaporator (RAV-183K-PE)
210	43A44025	Evaporator (RAV-243K-PE)
211	43172112	Drain Pan (RAV-183K-PE)
211	43172114	Drain Pan (RAV-243K-PE)
212	43170182	Drain Hose
213	43A09005	H-Grille (RAV-183K-PE)
213	43A09006	H-Grille (RAV-243K-PE)
214	43A09003	V-Grille
215	43A39004	Connection Rod
216	43022189	Bearing

Location No	Part No	Description
217	43120135	Cross Flow Fan (RAV-183K-PE)
217	43120136	Cross Flow Fan (RAV-243K-PE)
218	43A09004	Inlet Grille
219	43A80008	Air Filter
220	43A00001	Cabinet, Side Left
221	43A00002	Cabinet, Side Right
222	43A00003	Control Panel
223	43121533	Geared Motor
224	43A19002	Sensor Holder, TA
225	43019604	Sensor Holder, TC
226	43122028	Fan Nose (RAV-183K-PE)
226	43122029	Fan Nose (RAV-243K-PE)
227	43119394	Lever
228	43A91048	ASM D Cabi (RAV-183K-PE)
228	43A91049	ASM D Cabi (RAV-243K-PE)
232	43A62001	Cover, Remocon
233	43A88010	Manual
234	43A69007	Batteries, Remote

7.2 Outdoor unit

RAV-182A-PE

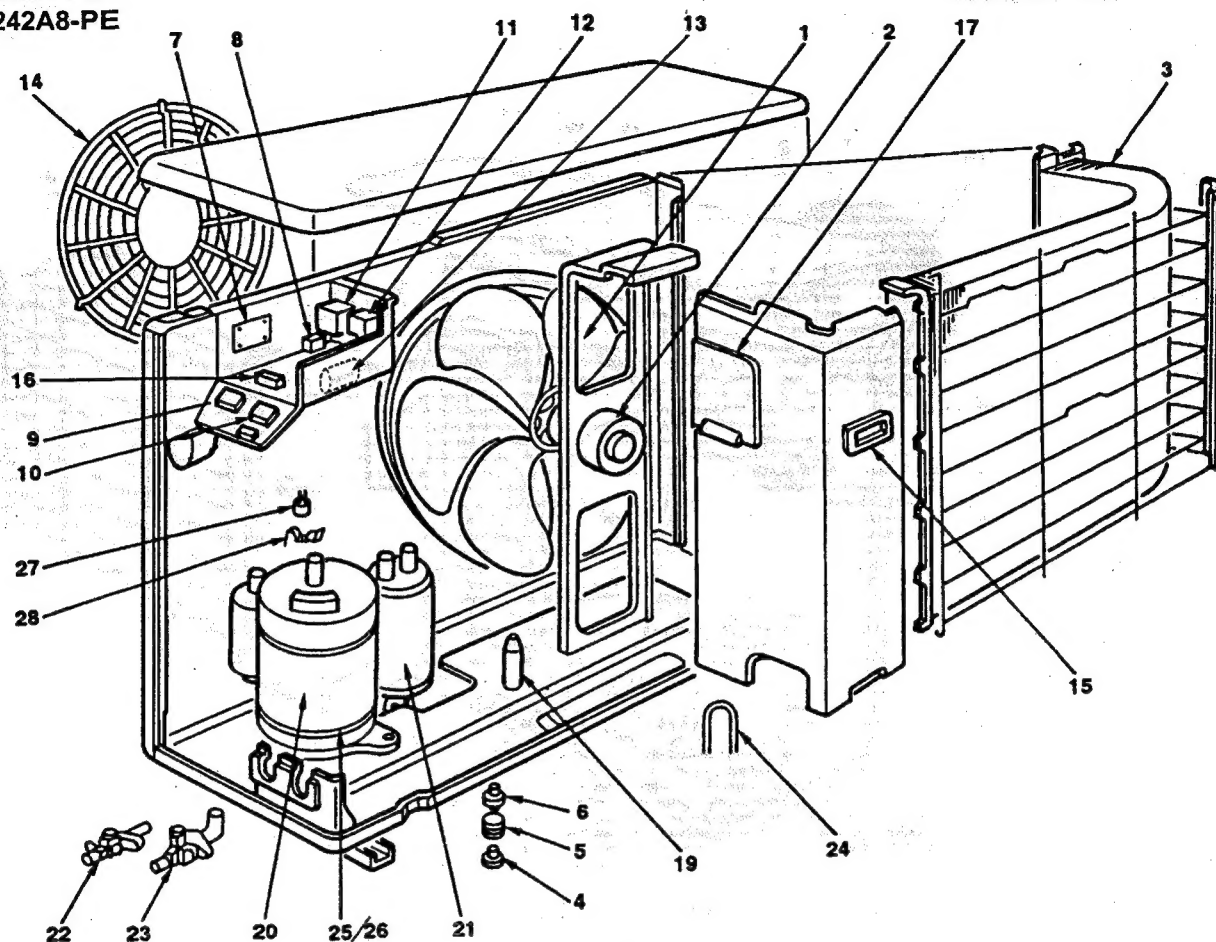


Location No.	Part No.	Description
1	43120156	Fan, Propeller
2	43A21012	Motor, Fan AC230V, 50Hz
3	43143642	Condenser
4	43049132	Base, Spring, B
5	43149198	Spring, Buffer
6	43149212	Base, Spring, A
7	43169584	Surge Absorber
8	43A49002	Pressure Switch, 2-stage
9	43A60003	Terminal, 2P
10	43A60001	Terminal, 4P
11	43152334	Magnetic Contactor
12	43155115	Capacitor, Plastic Film 45MFD, 440V

Location No.	Part No.	Description
14	43A19001	Guard, Fan
15	43119368	Hanger
16	43155080	Capacitor, Plastic Film
17	43162027	Cover, Electric Parts
19	43145098	Dryer
20	43041845	Compressor PH250X3-4LS
21	43148105	Accumulator
22	43146454	Packed Valve, Ø 6.4mm
23	43146406	Packed Valve, Ø 12.7mm
24	43146430	Capillary Tube
25	43157167	Heater, Crankcase
26	43193043	Spring

7.3 Outdoor unit

RAV-242A-PE
RAV-242A8-PE



Location No.	Part No.	Description
1	43120156	Fan, Propeller
2	43A21011	Motor, Fan AC230V,50Hz
3	43143644	Condenser
4	43049132	Base, Spring, B
5	43149198	Spring, Buffer
6	43149212	Base, Spring, A
7	43169584	Surge Absorber
8	43A49003	Pressure Switch, 2-stage
9	43A60004	Terminal, 2P (RAV-242A-PE)
9	43A60005	Terminal, 4P (RAV-242A8-PE)
10	43A60001	Terminal Block, 4P
11	43152334	Magnetic Contactor (RAV-242A-PE)
11	43152345	Magnetic Contactor (RAV-242A8-PE)
12	43154148	Return Lock, STR-4AD (RAV-242A8-PE)
13	43055379	Capacitor, Electrolytic (RAV-242A-PE) 60MFD,420V

Location No.	Part No.	Description
14	43A19001	Guard, Fan
15	43119368	Hanger
16	43155080	Capacitor, Plastic Film
17	43162027	Cover, Electric Parts
19	43145098	Dryer
20	43141302	Compressor (RAV-242A8-PE) YH330X3-MS
20	43140318	Compressor (RAV-242A-PE) PH330X3-4MS
21	43148105	Accumulator
22	43146454	Packed Valve, Ø 6.4mm
23	43146417	Packed Valve, Ø 15.9mm
24	43146430	Capillary Tube
25	43157167	Heater, Crankcase
26	43193043	Spring
27	43050277	Thermostat, Bimetal (RAV-242A8-PE)
28	43063195	Holder, Thermostat, Bimetal (RAV-242A8-PE)